AMENDMENTS TO THE SPECIFICATION

Please amend the paragraph on page 6, line 7, to line 25, as follows:

A data transmission device according to the present invention is connected to a ring-type data transmission network, and electrically communicates with another device via a transmission line in a unidirectional manner. The data transmission device includes: a processing section for processing received data and data to be transmitted based on a predetermined communications protocol; a reception section for receiving an electric signal sent from a preceding device and outputting data contained in the electric signal to the processing section; a transmission section for converting a result of a process by the processing section into an electric signal and transmitting the electric signal to a successive device; a power supply section for supplying power to the processing section, the reception section, and the transmission section; and a control section for controlling operation of the processing section, the reception section, and the transmission section in accordance with an operation mode of its own device. The reception section detects cessation of the electric signal sent from the preceding device ~~and, in response to the detection, stops operating. In response to the detection, the transmission section stops operating and stops sending the electric signal to the successive device.~~ If the reception section detects the cessation of the electric signal, the power supply section stops supplying power to the processing section, the reception section, and the transmission section. In response to either one of the cessation of the electric signal sent from the preceding device being detected and power supply from the power supply section being stopped, the reception section stops operating. In response to either one of the reception section detecting the cessation of the electric signal and the power supply from the power supply section being stopped, the transmission section stops operating and stops sending the electric signal to the successive device.

Please amend the paragraph on page 7, line 1, to line 13, as follows:

According to the above-described structure of the present invention, in a zero-power mode that stops operation of main hardware, the operation of the reception section and the transmission section included in the data transmission device is stopped, and power supply is also stopped; therefore power consumption of each of them is reduced, whereby power consumption of the entire device is greatly reduced. In addition, the data transmission device detects the cessation of the electric signal sent from the preceding data transmission device, then

shifts itself to the zero-power mode, and stops sending the electric signal to the successive data transmission device; therefore, the data transmission devices connected to the ring-type data transmission network are able to shift to the zero-power mode in combination.

Please amend the paragraph on page 7, line 14, to page 8, line 23, as follows:

As a first example, if the cessation of the electric signal sent from the preceding device is detected, the reception section transmits, to the control section, a data cessation signal for indicating the cessation; and based on the data cessation signal transmitted from the reception section, the control section stops operation of the processing section. As a second example, if the cessation of the electric signal sent from the preceding device is detected, the reception section transmits, to the control section, a data cessation signal for indicating the cessation; based on the data cessation signal transmitted from the reception section, the control section outputs a signal for stopping operation of the reception section and the transmission section; in response to the signal outputted from the control section in response to the detection, the reception section stops operating; and in response to the signal outputted from the control section in response to the detection, the transmission section stops operating and stops sending the electric signal to the successive device. As a third example, ~~a power supply section for supplying power to the processing section, the reception section, and the transmission section is further included;~~ if the cessation of the electric signal sent from the preceding device is detected, the reception section transmits, to the control section, a data cessation signal for indicating the cessation~~,~~; and based on the data cessation signal transmitted from the reception section, the control section performs control of stopping ~~stops~~ the power supply section from supplying power to the processing section, the reception section, and the transmission section. By these examples, in the zero-power mode, power supply to the processing section, the transmission section, and the reception ~~the operation of the processing~~ section included in the data transmission device is stopped~~, or power supply to the transmission section and the reception section is stopped. Therefore~~; therefore, power consumption is further reduced, and even in the case where the reception section and the transmission section do not have functions for turning off the power by themselves, their operation can be stopped, and moreover, power consumption of each of them can be completely restricted to zero.

Please amend the paragraph on page 8, line 24, to page 10, line 2, as follows:

Further, there may be included a signal monitoring section for detecting the electric signal sent from the preceding device and transmitting, to the control section, an electric-signal detection signal for indicating the detection. In this case, if suspended sending of the electric signal sent from the preceding device is resumed, the signal monitoring section detects the electric signal sent from the preceding device, and transmits, to the control section, the electric-signal detection signal for indicating the detection; based on the electric-signal detection signal transmitted from the signal monitoring section, the control section may perform control of allowing the power supply section to start supplying power to the processing section, the reception section, and the transmission section to start ~~starts~~ operation of the processing section, the reception section, and the transmission section; and by control of the control section, the transmission section may start ~~starts~~ operating and start ~~starts~~ sending the electric signal to the successive device. Because of this, once the sending of the electric signal from the preceding data transmission device is resumed, the data transmission device which has shifted to the zero-power mode detects the electric signal with the signal monitoring section, and starts operation of the processing section, the reception section, and the transmission section, thereby returning to a normal operation mode. Therefore, the data transmission device is capable of allowing the processing section, the reception section, and the transmission section, which had stopped their operation, to easily start their operation, thereby returning to the normal operation mode. In addition, after returning to the normal operation mode, the data transmission device resumes sending the electric signal to the successive data transmission device. Therefore, the data transmission devices connected to the ring-type data transmission network are able to return to the normal operation mode in combination.

Please amend the paragraph on page 11, line 2, to page 12, line 3, as follows:

A data transmission system according to the present invention includes a plurality of data transmission devices connected via a transmission line so as to form a ring structure, in which the data transmission devices electrically communicate with one another in a unidirectional manner. The data transmission devices each include: a processing section for processing received data and data to be transmitted based on a predetermined communications protocol; a reception section for receiving an electric signal sent from a preceding data transmission device

and outputting data contained in the electric signal to the processing section; a transmission section for converting a result of a process by the processing section into an electric signal and transmitting the electric signal to a successive data transmission device; a power supply section for supplying power to the processing section, the reception section, and the transmission section of its own device; and a control section for controlling operation of the processing section, the reception section, and the transmission section in accordance with an operation mode of its own device, wherein, in at least one of the data transmission devices, the control section stops operation of the processing section, the reception section, and the transmission section of its own device based on a predetermined condition for shift, and the transmission section stops transmission of the electric signal, and in another data transmission device, the reception section of its own device detects cessation of the electric signal sent from a preceding data transmission device; if the reception section detects the cessation of the electric signal, the power supply section of its own device stops supplying power to the processing section, the reception section, and the transmission section; in response to either one of the cessation of the electric signal sent from the preceding data transmission device being detected and power supply from the power supply section of its own device being stopped, the reception section of its own device ~~and, in response to the detection,~~ stops operating; and in response to either one of the reception section of its own device detecting the cessation of the electric signal and the power supply from the power supply section of its own device being stopped, the transmission section of its own device stops operating ~~in response to the detection~~ and stops sending the electric signal to the ~~a~~ successive data transmission device.

Please amend the paragraph on page 12, line 20, to page 14, line 2, as follows:

As a first example, in the other data transmission device, if the cessation of the electric signal sent from the preceding data transmission device is detected, the reception section transmits, to the control section of its own device, a data cessation signal for indicating the cessation; and based on the data cessation signal transmitted from the reception section of its own device, the control section stops operation of the processing section of its own device. As a second example, in the other data transmission device, if the cessation of the electric signal sent from the preceding data transmission device is detected, the reception section transmits, to the control section of its own device, a data cessation signal for indicating the cessation; based on

the data cessation signal transmitted from the reception section of its own device, the control section outputs a signal for stopping operation of the reception section and the transmission section of its own device; in response to the signal outputted from the control section of its own device in response to the detection, the reception section stops operating; and in response to the signal outputted from the control section of its own device in response to the detection, the transmission section stops operating and stops sending the electric signal to the successive data transmission device. As a third example, ~~the data transmission devices each further include a power supply section for supplying power to the processing section, the reception section, and the transmission section of its own device;~~ if the cessation of the electric signal sent from the preceding data transmission device is detected, the reception section transmits, to the control section of its own device, a data cessation signal for indicating the cessation; and based on the data cessation signal transmitted from the reception section of its own device, the control section performs control of stopping ~~stops~~ the power supply section of its own device from supplying power to the processing section, the reception section, and the transmission section.

Please amend the paragraph on page 14, line 3, to page 15, line 18, as follows:

In addition, the data transmission devices may each further include a signal monitoring section for detecting the electric signal sent from the preceding data transmission device and transmitting, to the control section, an electric-signal detection signal for indicating the detection. In this case, in at least one of the data transmission devices, based on a predetermined return condition, the control section may perform control of allowing the power supply section to start supplying power to ~~starts operation of~~ the processing section, the reception section, and the transmission section of its own device in stopped state to start operation of the processing section, the reception section, and the transmission section, and the transmission section may resume ~~resumes~~ the transmission of the electric signal, and in another data transmission device, if suspended sending of the electric signal sent from the preceding data transmission device is resumed, the signal monitoring section may detect ~~detects~~ the electric signal sent from the preceding data transmission device, and transmits, to the control section of its own device, the electric-signal detection signal for indicating the detection; based on the electric-signal detection signal transmitted from the signal monitoring section, the control section may perform control of allowing the power supply section to start supplying power to ~~starts operation of~~ the processing

section, the reception section, and the transmission section of its own device to start operation of the processing section, the reception section, and the transmission section; and the transmission section may start ~~starts~~ operating and start ~~starts~~ sending the electric signal to the successive data transmission device. Because of this, in the data transmission system which has shifted to the zero-power mode, at least one of the data transmission devices returns to a normal operation mode based on the predetermined return condition and thereafter resumes the sending of the electric signal from itself; and once the sending of the electric signal from the preceding data transmission device is resumed, another data transmission device detects the electric signal with the signal monitoring section, and starts operation of the processing section, the reception section, and the transmission section, thereby returning to the normal operation mode. Therefore, the data transmission device is capable of allowing the processing section, the reception section, and the transmission section, which had stopped their operation, to easily start their operation, thereby returning to the normal operation mode. In addition, after returning to the normal operation mode, each data transmission device resumes sending the electric signal to the successive data transmission device. Therefore, the data transmission devices connected to the data transmission network are able to return to the normal operation mode in combination.

Please amend the paragraph on page 16, line 4, to page 17, line 2, as follows:

In a data transmission method according to the present invention, a plurality of nodes are connected via a transmission line so as to form a ring structure, and each node electrically communicates with one another in a unidirectional manner. The data transmission method includes: a processing step, performed by each node, of processing received data and data to be transmitted based on a predetermined communications protocol; a reception step, performed by each node, of receiving an electric signal sent from a preceding node and sending data contained in the electric signal to the processing step; a transmission step, performed by each node, of transmitting a result of a process by the processing step to a successive node as an electric signal; a power supply step of supplying power used for operation in ~~and a control step, performed by each node, of controlling operation of~~ the processing step, the reception step, and the transmission step; and a control step, performed by each node, of controlling operation of ~~in accordance with an operation mode, wherein, in at least one of the nodes, the control step stops operation by~~ the processing step, the reception step, and the transmission step in accordance with

an operation mode, wherein, in at least one of the nodes, the control step stops operation by the processing step, the reception step, and the transmission step of the node based on a predetermined condition for shift, and the transmission step stops transmission of the electric signal, and in another node, the reception step detects cessation of the electric signal sent from the preceding node; if the reception step of its own node detects the cessation of the electric signal, the power supply step of its own node stops supplying power used for operation of the processing step, the reception step, and the transmission step of its own node; in response to either one of the cessation of the electric signal sent from the preceding node being detected and the power supply by the power supply step of its own node being stopped, the reception step of its own node stops operation; and in response to either one of the reception step of its own node detecting the cessation of the electric signal and the power supply step of its own node stopping supplying power, the transmission step of its own node stops operation ~~of the node based on a predetermined condition for shift, and the transmission step stops transmission of the electric signal, and in another node, the reception step detects cessation of the electric signal sent from a preceding node and, in response to the detection, stops operation; and the transmission step of its own node stops operation in response to the detection~~ and stops sending the electric signal to the ~~a~~ successive node.

Please amend the paragraph on page 17, line 3, to line 16, as follows:

According to the above-described structure of the present invention, in the zero-power mode which stops operation of main hardware included in each node, operation by the reception step and the transmission step is stopped, and power supply is also stopped; therefore, power consumption required for their operation is reduced, and power consumption of each entire node connected so as to form a ring structure is greatly reduced. In addition, at least one of the nodes shifts to the zero-power mode based on the predetermined condition for shift and thereafter stops the sending of the electric signal from itself; and another node detects the cessation of the electric signal sent from the preceding node, shifts itself to the zero-power mode, and stops sending the electric signal to the successive node. Therefore, each node connected so as to form a ring structure is able to shift to the zero-power mode in combination.

Please amend the paragraph on page 17, line 17, to page 18, line 18, as follows:

As a first example, in the other node, if the cessation of the electric signal sent from the preceding node is detected, the reception step sends, to the control step of its own node, a notification indicating the cessation, and based on the notification sent by the reception step of its own node, the control step stops operation by the processing step of its own node. As a second example, in the other node, if the cessation of the electric signal sent from the preceding node is detected, the reception step sends, to the control step of its own node, a notification indicating the cessation; based on the notification sent by the reception step of its own node, the control step sends a notification for stopping operation by the reception step and the transmission step of its own node; in response to the notification sent by the control step of its own node in response to the detection, the reception step stops operation, and in response to the notification sent by the control step of its own node in response to the detection, the transmission step stops operation and stops sending the electric signal to the successive node. As a third example, ~~the nodes each further include a power supply step of supplying power used for operation in the processing step, the reception step, and the transmission step;~~ if the cessation of the electric signal sent from the preceding node is detected, the reception step sends, to the control step of its own node, a notification indicating the cessation; and based on the notification sent by the reception step of its own node, the control step performs control of stopping ~~stops~~ the power supply step of its own node from supplying power used for operation of the processing step, the reception step, and the transmission step.

Please amend the paragraph on page 18, line 19, to page 20, line 2, as follows:

In addition, the nodes may each further include a signal monitoring step of detecting the electric signal sent from the preceding node and sending, to the control step, a notification indicating the detection. In this case, in at least one of the nodes, based on a predetermined return condition, the control step may perform control of allowing the power supply step to start supplying power used for ~~starts~~ operation of ~~by~~ the processing step, the reception step, and the transmission step of its own node in stopped state to start operation by the processing step, the reception step, and the transmission step, and the transmission step may resume ~~resumes~~ the transmission of the electric signal, and in another node, if suspended sending of the electric signal sent from the preceding node is resumed, the signal monitoring step may detect ~~detects~~ the

electric signal sent from the preceding node, and ~~sends~~ send, to the control step of its own node, the notification indicating the detection; based on the notification indicating the detection sent by the signal monitoring step, the control step may perform control of allowing the power supply step to start supplying power used for ~~starts~~ operation of ~~by~~ the processing step, the reception step, and the transmission step of its own node to start operation by the processing step, the reception step, and the transmission step; and operation by the transmission step may be ~~is~~ started to start the sending of the electric signal to the successive node. Because of this, regarding the nodes which have shifted to the zero-power mode, at least one of the nodes returns to the normal operation mode based on the predetermined return condition and thereafter resumes the sending of the electric signal by itself; and once the sending of the electric signal from the preceding node is resumed, another node detects the electric signal with the signal monitoring step and starts operation by the processing step, the reception step, and the transmission step, thereby returning to the normal operation mode. Therefore, the node is capable of allowing the processing step, the reception step, and the transmission step, which had stopped their operation, to easily start their operation, thereby returning to the normal operation mode. In addition, after returning to the normal operation mode, each node resumes sending the electric signal to the successive node. Therefore, the nodes connected so as to form a ring structure are able to return to the normal operation mode in combination.

Please amend the paragraph on page 37, line 15, to page 38, line 5, as follows:

The operation for shifting to the zero-power mode applied to the data transmission device 1b also applies to the other slave data transmission devices 1c to 1f. That is, as a result of the input of the electric signal Min inputted from the transmission line 80b having been stopped, the data transmission device 1c shifts to the zero-power mode; as a result of the input of the electric signal Min inputted from the transmission line 80c having been stopped, the data transmission device 1d shifts to the zero-power mode; as a result of the input of the electric signal Min inputted from the transmission line 80d ~~80e~~ having been stopped, the data transmission device 1e shifts to the zero-power mode; and, as a result of the input of the electric signal Min inputted from the transmission line 80e having been stopped, the data transmission device 1f shifts to the zero-power mode. The combination of these operations causes all data transmission devices 1a to 1f connected to the data transmission system to shift to the zero-power mode.

Please amend the paragraph on page 48, line 25, to page 49, line 20, as follows:

The operation for shifting to the zero-power mode applied to the data transmission device 1b also applies to the other slave data transmission devices 1c to 1f. That is, as a result of the input of the electric signal Min inputted from the transmission line 80b having been stopped, the data transmission device 1c shifts to the zero-power mode; as a result of the input of the electric signal Min inputted from the transmission line 80c having been stopped, the data transmission device 1d shifts to the zero-power mode; as a result of the input of the electric signal Min inputted from the transmission line 80d ~~80e~~ having been stopped, the data transmission device 1e shifts to the zero-power mode; and, as a result of the input of the electric signal Min inputted from the transmission line 80e having been stopped, the data transmission device 1f shifts to the zero-power mode. The combination of these operations causes all data transmission devices 1a to 1f connected to the data transmission system to shift to the zero-power mode. In contrast to the operation of steps S52 to S58 shown in FIG. 3, the operation of steps S72 to S76 allows the transmission/reception section 4 itself to stop output of the electric signal Mout; therefore, the entire data transmission system shifts to the zero-power mode quickly.